HARMONY GROVE VILLAGE

APPENDIX M

EXISTING SOILS DATA

and

APPENDIX T

EXISTING HYDROLOGY/WATER QUALITY DATA

VTM 5365; GPA 04-04; MUP 04-012, MUP 04-013, and MUP 04-014;
REZ 04-010; SP 04-03; Log No. 04-08-011; SCH No. 2004071004

for the

DRAFT ENVIRONMENTAL IMPACT REPORT
AUGUST 2006

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Table 1
SUMMARY DESCRIPTION OF SOIL SERIES PROPERTIES
WITHIN THE PROJECT SITE AND APPLICABLE OFF-SITE AREAS

Soil Series	Physical Characteristics/Location	Expansion Potential	Reactivity	Erosion Potential
Chino	Moderately well-drained fine sandy loam derived from granitic alluvium. Occurs in level areas in the east-central site area.	Moderate	Slightly acidic to moderately alkaline (pH 6.1 to 8.4)	Low
Cieneba	Excessively-drained coarse sandy loam derived from granitic rock. Occurs on shallow to steep slopes in the northwest and southeast site areas, as well as portions of off-site road options A (Citracado Parkway), B and C (Via Rancho Parkway and Del Dios Highway/Valley Parkway).	Low	Moderately acidic (pH 5.6 to 6.0)	Low to high
Escondido	Well-drained, very fine sandy loam derived from meta-sandstone. Occurs on moderate to steep slopes in the southern, western and north-central portions of the site.	Low	Slightly acidic to neutral (pH 6.1 to 7.3)	Moderate to high
Exchequer	Well-drained silt loam derived from meta-basic rock. Occurs on steeper slopes in the northwestern portion of the site.	Low	Slightly acidic (pH 6.1 to 6.5	High
Fallbrook	Well-drained sandy loam derived from igneous rock. Occurs on moderate slopes n the northwestern site area, as well as off-site road options A and C (Citracado Parkway, Andreasen Drive and Harmony Grove Road).	Moderate	Slightly acidic to neutral (pH 6.1 to 7.3)	Moderate
Friant	Well-drained fine sandy loam derived from meta-sedimentary rock. Occurs on moderate to steep slopes in the western site area.	Low	Mildly to moderately alkaline (pH 7.4 to 8.4)	Moderate to high
Grangeville	Poorly-drained sandy loam derived from granitic alluvium. Occurs in level areas within off-site road option C (Harmony Grove Road).	Low	Moderately to very strongly alkaline (pH 7.9 to 9.2)	Low
Greenfield	Well-drained sandy loam derived from granitic alluvium. Occurs in level areas within off-site road option B (Avenida del Diablo).	Low	Slightly acidic (pH 6.1 to 6.5	Low
Huerhuero	Moderately well-drained sandy loam derived from sedimentary rock. Occurs on shallow slopes in the central and western site areas, as well as much of the off-site pump station site.	High	Strongly acidic to slightly alkaline (pH 5.1 to 7.8)	Low to moderate
Las Posas	Well-drained fine sandy loam derived from igneous rock. Occurs on moderate to steep slopes in the eastern site area and off-site road options A, B and C (Avenida del Diablo and Harmony Grove Road).	High	Neutral (pH 6.6 to 7.3)	Moderate to high

Table 1 (cont.)

Soil Series	Physical Characteristics/Location	Expansion Potential	Reactivity	Erosion Potential
Placentia	Moderately well-drained sandy loam derived from granitic alluvium. Occurs on shallow slopes in off-site road options A and C (Harmony Grove Road and Citracado Parkway).	High	Moderately acidic to alkaline (pH 5.6 to 8.4)	Low to moderate
Ramona	Well-drained sandy loam derived from granitic alluvium. Occurs on shallow slopes in off-site road options A and C (Harmony Grove Road).	Moderate	Moderately acidic to neutral (pH 5.6 to 7.3)	Low to moderate
Soboba	Excessively-drained stony loamy sand derived from granitic alluvium. Occurs on moderate slopes in the southeast corner of the off-site pump station site.	Low	Neutral (pH 6.6 to 7.3)	Moderate to high
Steep Gullied Land	Steep to very steep slopes that are actively eroding to older alluvium or weathered bedrock. Occurs on steep slopes in portions of off-site road options A, B and C (Via Rancho Parkway and Del Dios Highway/Valley Parkway).	Variable	N/A	High
Visalia	Moderately well-drained sandy loam derived from granitic alluvium. Occurs in level areas in the southern, eastern and north-central site areas, as well as portions of off-site road options A and C (Andreasen Drive, Auto Park Way and Harmony Grove Road).	Low	Slightly acidic (pH 6.1 to 6.5)	Low to moderate
Vista	Well-drained coarse sandy loam derived from igneous rock. Occurs on shallow to steep slopes in off-site road options A, B and C (Andreasen Drive, Auto Park Way, Harmony Grove Road, Citracado Parkway and Avenida del Diablo).	Low	Slightly acidic to neutral (pH 6.1 to 7.3)	Low to moderate
Wyman	Well-drained loam derived from igneous rock. Occurs in level areas in the southern-most portion of the project site.	Moderate	Slightly acidic to neutral (pH 6.1 to 7.3)	Low to moderate

N/A = Not assessed.
Source: SCS (1973)

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EXISTING HYDROLOGY/WATER QUALITY DATA

The following information is intended to supplement existing conditions data provided in the project Drainage Study/ Hydraulic Analysis and Stormwater Management/ Maintenance Plan (Rick Engineering Company 2006a and 2006b). The referenced reports are included in their entirety as Appendix U of the EIR.

Watershed and Drainage Characteristics

The project site and most proposed off-site facilities (except one potential road improvement area as described below) are within the Carlsbad Hydrologic Unit (HU), 1 of 11 such drainage areas designated in the 1994 (as amended) San Diego Regional Water Quality Control Board (RWQCB) *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Carlsbad HU is a roughly triangular shaped area of approximately 210 square miles (mi^2), and extends from east of Lake Wohlford to Solana Beach-Carlsbad along the coast. The Carlsbad HU is divided into a number of hydrologic areas and subareas based on local drainage characteristics, with the project site and vicinity (including the off-site utility sites and applicable road improvement areas) located within the Escondido Hydrologic Subarea (HSA) of the Escondido Creek Hydrologic Area (HA, Figure 1). Drainage within the Carlsbad HU is provided by a number of small to moderate size streams, including Buena Vista, Agua Hedionda, San Marcos and Escondido creeks. Surface drainage in the 44-mi^2 Escondido HSA occurs primarily through Escondido Creek, which extends through the southern portion of project site and continues south and west before ultimately entering San Elijo Lagoon near the City of Solana Beach (approximately 11 miles downstream of the project site). Annual precipitation in the Carlsbad HU ranges from approximately 12 inches along the coast to over 20 inches east of Lake Wohlford, with the project site and vicinity averaging approximately 13.5 inches of rainfall per year (RWQCB 1994, as amended; MEC Analytical Systems, Inc. [MEC] 2004).

The proposed off-site road improvement area encompassing the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection (off-site Village Road) is located within the San Dieguito HU. The San Dieguito HU is an irregularly-shaped area of approximately 350 mi^2 extending from the eastern boundary of the San Diego Basin (approximately five miles east of Santa Ysabel) to Del Mar/Solana Beach along the coast. The San Dieguito HU is divided into several HAs and HSAs (as noted above for the Carlsbad HU), with the noted roadway area within the Del Dios HSA of the Hodges HA (Figure 1). Surface drainage in the San Dieguito HU occurs through the San Dieguito River and major tributaries including Santa Ysabel and Santa Maria creeks. Surface drainage in the Hodges HA and Del Dios HSA occurs through the San Dieguito River and several unnamed tributaries. Annual precipitation in the San Dieguito HU ranges from approximately 10.5 inches along the coast to 31.5 inches at some inland locations, with the described road improvement area averaging approximately 13.5 inches of rainfall per year (MEC 2004).

Surface drainage from the entire project site and all off-site facilities (except the one described off-site road improvement area) flows to Escondido Creek, which extends generally east/west through the southern portion of the property. Most of the northern portion of the site (i.e., north of Escondido Creek) drains generally to the south through Eden Valley Creek and two unnamed blue-line streams, as depicted on the U.S. Geological Survey (USGS) Rancho Santa Fe and Escondido Quadrangles (Figure 2). As mapped on the referenced quadrangle sheets, Eden Valley Creek enters the northeastern portion of the site and extends generally north/south to intersect Escondido Creek south of Harmony Grove Road. One of the unnamed blue-line streams enters the northwest corner of the site and flows south/southeast before joining Eden Valley Creek approximately 2,000 feet north of Escondido Creek. The second unnamed blue-line stream enters the western portion of the site and flows generally east towards the above described confluence. Minor portions of the site north of Harmony Grove Road drain directly to Escondido Creek as non-point runoff, including several south-facing slopes (e.g., near the quarry site). The portion of the site south of Escondido Creek drains predominantly north or west directly to the creek, with drainage from west-facing slopes in the southwestern corner flowing off-site prior to reaching Escondido Creek.

Surface runoff from most off-site facilities drains directly into Escondido Creek (e.g., portions of Harmony Grove Road, refer to Figure 2), or flows through one or more unnamed tributaries prior to reaching Escondido Creek (e.g., portions of the off-site sewer line corridors in sewer service Options 2a and 2b). The potential road improvement area at Del Dios Highway/Valley Parkway and Via Rancho Parkway (off-site Village Road) drains south through an unnamed creek for approximately one mile before entering Lake Hodges. Overflow from the Lake Hodges spillway enters the San Dieguito River approximately two miles downstream of where the noted unnamed creek enters the lake, with the River continuing west and south for approximately nine miles before reaching the San Dieguito Lagoon and coastal waters in the City of Del Mar.

Substantial portions of the project site have been previously developed, with internal drainage patterns varying somewhat from the mapped conditions described above (although the entire site remains tributary to Escondido Creek). Existing on-site improvements include several estate residential properties (including septic systems); structures, roads, ponds, drains, storage tanks, material stockpiles (e.g., manure and wood chips), wells and other facilities related to agricultural egg and dairy operations; avocado/citrus orchards; and an inactive rock/gravel quarry site. Existing drainage facilities within the project site include agricultural ponds, drainage diversion and French drain structures in the central portion of the site, and a series of leach lines and smaller drains (tile and floor drains) designed to collect water from agricultural operations. The diversion channel was constructed in 1976 in coordination with the U.S. Soil Conservation Service, and is designed to divert surface flows around (west of) existing dairy cattle pens. The diversion was extended further south in 1985 and diverts surface flows associated with Eden Valley Creek and the unnamed drainage entering the site from the northwest, with flows in the diversion channel continuing generally south to Escondido Creek. The French drain was constructed in 1990, and extends approximately 500 feet through the De Raadt Dairy cattle pen structure. This drain intercepts shallow groundwater associated with the above described surface flow diversion. That is, while the diversion channel routes surface flows west of the cattle pens, associated subsurface flow follows the original drainage pattern and has caused ponding and muddy conditions in the cattle pens. This subsurface flow (along with any water percolating from the cattle pens) is collected in the French drain and conveyed to the east, where it is collected and used for agricultural activities such as animal washing. The other drains are intended to prevent water containing agricultural contaminants from reaching surface and groundwater sources, pursuant to RWQCB requirements described below under Water Quality (PETRA Environmental Division [PETRA] 2002). Off-site drainage facilities downstream of the project site include storm drain systems in developed areas, as well as crossing structures such as bridges and culverts along Escondido Creek (e.g., at Interstate 15 approximately 3 miles to the east, and Camino Del Norte approximately 6 miles to the southwest) and the San Dieguito River (e.g., Interstate 5 approximately one mile east of the coast).

The project site is within a larger local watershed that includes a number of off-site (upstream) areas. The total watershed includes approximately 1,800 acres, with the project site located at the downstream end of the watershed area. Existing peak discharge rates for 2-year, 10-year and 100-year storm flows within the described 1,800-acre watershed (including the project site) are 942, 1,812 and 3,991 cubic feet per second (cfs), respectively (refer to Appendix U of the EIR). These flows move through the property as described above and enter Escondido Creek within or adjacent to the project site.

Surface water was observed in several on-site agricultural ponds, as well as the unnamed blue-line stream entering the northwestern site corner during field studies conducted for the project Phase I/Phase II hazardous material investigations. Based on information provided by one of the on-site agricultural operators in a related interview, water in the noted drainage is reportedly derived from irrigation runoff associated with the orchards located in the northwestern portion of the site. At the time of the Phase I/Phase II field investigations, surface water in the noted drainage flowed through the northwest and central portions of the site, and disappeared due to percolation and/or evaporation approximately 1,100 feet north of Harmony Grove Road (PETRA 2002).

Flood Hazards

The project site and vicinity have been mapped for flood hazards by the Federal Emergency Management Agency (FEMA). Most of the site is designated as Zone X, or areas determined to be outside the 500-year (and therefore the 100-year) floodplain (FEMA 1997a and 1997b). Portions of the project site and off-site road and sewer service option study corridors along Escondido Creek, however, are within the mapped 100-year floodway (i.e., the main flood channel) and/or floodplain. Specifically, the mapped floodway/floodplain extends through the southern portion of the project site and encompasses portions of the proposed development area on both sides of Escondido Creek. The "current condition" 100-year floodplain was modeled as part of the project hydrologic engineering center (HEC-2) analysis (Appendix U), with the resulting floodplain location shown on Figure 2 (refer to Map Pockets 3 and 4 of Appendix U for additional information). Off-site facilities within the modeled 100-year floodplain include the proposed extension of Avenida del Diablo to the west across Escondido Creek (off-site Village Road, with the crossing to consist of a bridge structure), and portions of the potential sewer line corridors extending east/northeast from the project site (sewer service Options 2a and 2b). Detailed information on existing flood elevations along Escondido Creek in the project vicinity are provided in Appendix U of the EIR.

Groundwater

The occurrence of shallow groundwater in the Escondido Creek HSA has been historically associated with larger drainages, including Escondido and Reidy Canyon creeks. Shallow aquifers in both alluvial and bedrock deposits were observed during a 1987 study at depths of between approximately 7 and 20 feet below the surface along upstream portions of Escondido Creek (approximately 2 miles upstream of the site, USGS 1989). Historical groundwater movements in the site vicinity have been generally east to west along Escondido Creek and north to south along Reidy Canyon Creek. No known historical data are available regarding shallow groundwater conditions within the Hodges HA and Del Dios HSA, although shallow groundwater likely occurs in portions of these areas, potentially including the described roadway improvement at the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection (off-site Village Road).

Shallow groundwater was observed within the project site during subsurface explorations conducted for project geotechnical and Phase I/Phase II hazardous material investigations. The Phase I/Phase II investigations documented groundwater at two locations in the south-central portion of the site (near existing agricultural facilities just north of Harmony Grove Road) at depths of approximately 7 and 15.5 feet below the surface, and at one location in the central portion of the site at a depth of approximately 4.5 feet below the surface (PETRA 2002). The noted geotechnical investigations encountered shallow groundwater or seepage at 13 locations, including 10 test pits or borings in the northeastern and central portions of the site (north of Harmony Grove Road), 2 borings south of Harmony Grove Road and north of Escondido Creek, and 1 boring south of Escondido Creek. Depths to groundwater in the sites north of Harmony Grove Road ranged from approximately 3 to 13.5 feet below the surface, while groundwater depths at the two sites between Harmony Grove Road and Escondido Creek were 10 and 12 feet below the surface, and the site south of Escondido Creek encountered seepage at a depth of approximately 20 feet (Pacific Soils Engineering, Inc [PSE] 2005a, 2005b and 2003). All groundwater encountered during the noted investigations was in alluvium, with on-site alluvial aquifers likely hydraulically continuous with more extensive alluvium and associated groundwater in Escondido Creek (PETRA 2002). Shallow groundwater may also be present in other portions of the site (e.g., smaller alluvial drainages), particularly as perched aquifers. Perched aquifers consist generally of unconfined (i.e., not under pressure) groundwater separated from underlying permanent groundwater bodies by impermeable or semi-permeable strata, and are typically associated with seasonal precipitation and/or landscape irrigation.

Seven wells were identified within the site during Phase I/Phase II hazardous materials investigations and interviews conducted with current property owners/agricultural operators. Identified wells include one in active (albeit irregular) use and six that are operable (or potentially operable) but not currently in use due to lack of demand, water quality concerns and/or insufficient volume.

No known data are available regarding the occurrence of shallow groundwater at identified off-site study areas. One existing well is located approximately 0.5 mile south of the proposed roadway improvements at the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection. This well was originally drilled in 1944 to a depth of 49 feet, with groundwater produced from weathered bedrock. The well was redrilled and deepened in 1988, with groundwater produced from fractured bedrock and the well depth proprietary (California Department of Water Resources [DWR] 1993). The presence of shallow groundwater is considered likely in a number of the proposed off-site areas, particularly those sites located in close proximity to Escondido Creek or other existing drainages.

Water Quality

Surface Water

Carlsbad Hydrologic Unit

Surface water within the project site consists primarily of intermittent flows from storm events and runoff from agricultural (or other) irrigation. As previously noted, water from most agricultural operations is collected in a series of drains and other facilities, with runoff from the De Raadt dairy operation disposed of via surface application. These activities are based on Waste Discharge Requirements (WDRs) issued for on-site dairy operations by the RWQCB (PETRA 2002). The WDRs authorize on-site surface disposal of effluent collected from dairy operations, but stipulate that:

> *Discharges of facility wastewater to disposal fields or crop lands shall not result in surface runoff from disposal fields and shall be managed to minimize percolation to groundwater. The waste water or waste solids disposal operation shall not cause unusual odors or other nuisance beyond the limits of the dairy property. Application of manure and wastewater to disposal fields shall be at rates which are reasonable for the crop, soil, climate, special conditions and type of manure.*

Additional WDR requirements associated with the on-site dairy operations stipulate that:

> *The discharge of dairy wastewater or waste solids shall not (A) cause the Regional Board's objectives for the ground or surface waters of the Escondido Hydrologic Subarea, as established in the Basin Plan, to be exceeded; and (B) cause pollution, contamination or nuisance or adversely affect beneficial uses of the ground or surface waters of the Escondido Hydrologic Subarea, as established in the Basin Plan.*

A number of violation notices were issued for the described WDRs (as observed during review of RWQCB files), although these notices were related mainly to procedural items (e.g., late submissions) and no outstanding violations were observed (PETRA 2002).

One surface water sample was collected and tested during the project hazardous materials investigation. This sample site is located within Eden Valley Creek just north of Harmony Grove Road. Test results from the described sample indicate generally poor water quality conditions, with measured levels for several contaminants exceeding Basin Plan water quality objectives. Specifically, measured contaminant levels exceeding Basin Plan objectives include total dissolved solids (TDS, 2,800 milligrams per liter [mg/l]), chloride (600 mg/l), sulfate (1,000 mg/l), sodium (650 mg/l) and iron (0.42 mg/l, PETRA 2002). Since the sample taken was downstream of some of the onsite agricultural operations (e.g., dairy operations), it is probable that a portion of the contaminants found in the sample are related directly to these agriculture sources. It should be noted, however, that this drainage originated north of the project site with the sources upstream unknown.

The principal surface waters located downstream of the project site include Escondido Creek, San Elijo Lagoon and adjacent ocean waters. No known historical quantitative testing data are available for San Elijo Lagoon and adjacent ocean waters, with available information including recent testing data and qualitative assessments conducted by the State Water Resources Control Board (SWRCB) and RWQCB (as described below). Historical water quality data for Escondido Creek include sampling conducted within or adjacent to the project site (i.e., at or near Harmony Grove) between 1950 and 1981, and in 1987. These data indicate generally moderate to poor water quality conditions, as characterized by TDS levels ranging from 835 to 1,500 mg/l (with a median level of 1,260 mg/l) between 1950 and 1972, and from 1,020 to 1,380 mg/l (with a median level of 1,240 mg/l) between 1974 and 1981 (with all samples collected at Harmony Grove). The 1987 sampling efforts were conducted slightly upstream of the previous samples, with observed TDS levels of 1,000 and 1,100 mg/l (USGS 1989).

Recent water quality monitoring has been conducted along Escondido Creek in association with requirements under the San Diego RWQCB National Pollutant Discharge Elimination System (NPDES) Municipal Storm Water Permit (NPDES No. CAS0108758, RWQCB Order No. 2001-01). Data collection for the described monitoring was conducted at a number of mass loading stations (MLSs) during the 2001/2002 through 2003/2004 storm seasons, including the Escondido Creek MLS located approximately six miles southwest (downstream) of the project site (i.e., beneath the Camino Del Norte bridge in the City of Encinitas). Monitoring efforts at the Escondido Creek MLS involved numerous constituents of concern (COCs), including nitrogen compounds, phosphorus, oil and grease, bacterial indicators, pH, turbidity, chemical oxygen demand (COD), biochemical oxygen demand (BOD), TDS, total suspended solids (TSS), metals, chemical pesticides (including diazinon and chlorpyrifos) and toxicity to aquatic test organisms. Wet season monitoring at the Escondido Creek MLS included three storm events each during 2001/2002 through 2003/2004, in conjunction with requirements under RWQCB Order No. 2001-01 and the related Carlsbad Watershed Urban Runoff Management Program (WURMP, City of Encinitas 2003). The noted RWQCB Order mandates a watershed-based strategy for water quality management, with this methodology reflected in the WURMP and associated monitoring efforts. Data compiled during the 2001/2002 through 2003/2004 monitoring seasons documented that applicable water quality standards (e.g., Basin Plan water quality objectives) were exceeded for a number of constituents, including the following: (1) fecal coliform and TDS standards were exceeded for all 3 storm events in all 3 monitoring seasons; (2) turbidity standards were exceeded for 2 of 3 storm events in 2001/2002, and all 3 storm events in 2002/2003 and 2003/2004; (3) diazinon standards were exceeded for all 3 storm events in 2001/2002 and 2 of 3 storm events in 2002/2003; (4) TSS standards were exceeded for 2 of 3 storm events in 2002/2003 and all 3 storm events in 2003/2004; (5) chlorpyrifos standards were exceeded for 1 of 3 storm events in 2002/2003; (6) BOD and COD standards were exceeded for 1 storm event in 2003/2004; and (7) toxicity standards were exceed in 2 of 3 storm events in 2001/2002 (MEC 2005, 2004, 2003).

In addition to the above described monitoring, biological assessment (bioassessment) studies were conducted between 2001 and 2004 as part of the NPDES Storm Water Permit requirements, as well as for a separate program completed by the RWQCB between 1998 and 2001 (RWQCB 2002, 2001, 1999). These studies include a combined total of 5 sampling sites along Escondido Creek, with specific testing locations and dates as follows: (1) downstream of the Harmony Grove Bridge (approximately 0.7 mile northeast [upstream] of the project site), with testing conducted in May, September and November 1998, May and November 1999, November 2000, June and October 2001, May and October 2002, May and October 2003, and May 2004; (2) just downstream of Country Club Drive (within the project site), with testing conducted in May and October 2002, and May 2003; (3) downstream of the old Elfin Forest Resort (approximately 2.5 miles southwest [downstream] of the project site), with testing conducted in May, September and November 1998, May and November 1999, May 2000, June and October 2001, May and October 2002, May and October 2003, and May 2004; (4) Vista Canyon (approximately 3 miles southwest [downstream] of the project site), with testing conducted in May and October 2002 and May 2003; and (5) upstream of Rancho Santa Fe Road (approximately 7.3 miles southwest [downstream] of the project site in the City of Encinitas), with testing conducted in May 1998, June and October 2001, May and October 2002, and May 2003 (MEC 2005, 2004, 2003; RWQCB 2002, 2001, 1999). Bioassessment testing involves evaluation of (among other criteria) the

taxonomic richness (i.e., number of taxonomic groups) and diversity (i.e., species diversity within taxonomic groups) of benthic macroinvertebrate (BMI) communities. All tested sites were numerically ranked for the condition of BMI communities, with the described locations typically at or below the mean ranking for all sites. Because BMI communities are sensitive to water quality (including criteria such as dissolved oxygen, sedimentation, nutrients and chemical/organic pollutants), the generally low rankings for the described sites likely reflect (at least in part) poor local water quality conditions.

Beginning with the 2002/2003 storm season, ambient bay and lagoon monitoring was initiated for a number of coastal waters, including the San Elijo Lagoon (pursuant to RWQCB Order No. 2001-01). The intent of this monitoring program is to document conditions including sediment chemistry, toxicity and ecological community structure, as well as to provide indications of the overall status of marine life and determine priorities for additional investigations and remedial actions. Preliminary (Phase I) efforts consisted of conducting literature reviews and implementing sediment sampling efforts to assess grain size distributions and correlations with total organic carbon (TOC) content. Specifically, these analyses are based on the premise that fine-grained sediments tend to have large surface areas that are susceptible to adsorption by contaminants including metals and pesticides. Initial results for San Elijo Lagoon identified three (out of nine) samples with TOC/grain size relationships that were identified for additional (Phase II) analysis in the 2003/2004 season monitoring report (MEC 2004). The Phase II program involved testing of samples from the three noted sites in for sediment chemistry, toxicity and benthic community structure. Samples from San Elijo Lagoon exhibited generally moderate individual and overall (i.e., relative to other sampled embayments) quality rankings for sediment chemistry (although all constituents tested for were present), and low quality rankings for toxicity and benthic community structure. The described rankings were qualified somewhat in the monitoring report, based on the inherently different conditions exhibited at individual embayments (making comparative rankings difficult), as well as the fact that the described results are based on only one year of data (MEC 2005).

The SWRCB and RWQCB produce bi-annual qualitative assessments of statewide and regional water quality conditions. Since 1998, these assessments have focused on federal Clean Water Act (CWA) Section 303(d) impaired water listings and priority status for assignment of total maximum daily load (TMDL) requirements. The Section 303(d) and TMDL assessments involve prioritizing receiving waters on the basis of water quality (i.e., impaired) status and the necessity for assigning quantitative contaminant load restrictions (i.e., TMDL), with these data submitted to the U.S. Environmental Protection Agency (EPA) for review and approval. The most current (2002) assessment was approved by the EPA on July 25, 2003 and does not identify any impaired water bodies within or adjacent to the project site and vicinity (including applicable off-site facility locations). Impaired waters located downstream of the site include San Elijo Lagoon and the Pacific Ocean shoreline at Escondido Creek (i.e., at the San Elijo Lagoon outlet). The impaired listing for San Elijo Lagoon affects an estimated area of 566 acres, and includes a low TMDL priority based on bacterial indicators and eutrophic conditions, and a medium TMDL priority due to sedimentation/siltation. The impaired listing for the Pacific Ocean at Escondido Creek affects approximately 0.44 mile of shoreline and includes a low TMDL priority related to bacterial indicators (SWRCB 2003).

Based on the quantitative and qualitative information described above, existing water quality in both local and downstream surface waters is considered generally moderate to poor. This conclusion is derived from historical and recent sampling efforts conducted within and downstream of the project site, as well as the urban and/or agricultural nature of most associated watersheds.

San Dieguito Hydrologic Unit

No known water quality data are available from the off-site roadway improvement site located at the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection (off-site Village Road). Historical water quality data from areas in the vicinity of the noted intersection include the following samples: (1) a single sample collected in 1991 from an unnamed drainage approximately 0.9 mile south of the noted intersection; (2) multiple samples collected within Lake Hodges between 1949 and 1991; and (3) multiple samples collected

just upstream of Lake Hodges in San Pasqual Valley between 1952 and 1958. The 1991 sample from the unnamed drainage exhibited relatively poor water quality, as characterized by a TDS level of 1,330 mg/l. Data from Lake Hodges during the period of 1949 to 1991 exhibit variable water quality, with TDS levels ranging from approximately 200 to 2,250 mg/l and concentrations generally increasing as the volume of water in the lake decreases. The samples collected upstream of the lake in San Pasqual Valley between 1952 and 1958 exhibited generally good water quality, with TDS levels ranging between 130 and 760 mg/l (DWR 1993).

Recent water quality monitoring has been conducted along the San Dieguito River in association with the NPDES Municipal Storm Water Permit and the San Dieguito WURMP (City of San Diego 2003), as described above for the Carlsbad HU. Specifically, data were collected during the 2001/2002 through 2003/2004storm seasons at the San Dieguito MLS, which is located in a natural channel off Villa De La Valle approximately five miles southwest (downstream) of Lake Hodges. Monitoring at the San Dieguito MLS involved similar COCs and sampling efforts as described above for the Escondido Creek MLS, with applicable water quality standards exceeded for a number of constituents as follows: (1) TDS standards were exceeded for all 3 storm events in all 3 monitoring seasons; (2) chlorpyrifos standards were exceeded for all 3 storm events in the 2001/2002 and 2002/2003 monitoring seasons; (3) pH, BOD, TSS and COD standards were each exceeded for 1 storm event in the 2003/2004 monitoring season; (4) turbidity standards were exceed for 2 storm events in the 2003/2004 monitoring season; (5) toxicity standards (for variable organisms) were exceed for all 3 storm events in 2001/2002 and 2 of 3 storm events in 2002/2003 and 2003/2004; (6) fecal coliform standards were exceed for 2 of 3 storm events in 2002/2003 and 2003/2004; and (7) copper standards were exceed for 1 of 3 storm events in 2002/2003 (MEC 2005, 2004, 2003).

Bioassessment studies were also conducted for a number of applicable up- and downstream sites in the San Dieguito River watershed, as part of the described 2002/2003 and 2003/2004 NPDES sampling and the RWQCB efforts in 2000 and 2001 (RWQCB 2002, 2001). These studies include a combined total of 3 sampling sites, with specific testing locations and dates as follows: (1) along the San Dieguito River downstream of Lake Hodges (approximately 3.5 miles downstream of the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection), with testing conducted in October 2002, May and October 2003, and May 2004; (2) along Green Valley Creek at West Bernardo Drive (approximately 0.5 mile upstream of Lake Hodges), with testing conducted in November 2000, October 2002, May and October 2003, and May 2004; and (3) along Santa Ysabel Creek at State Route (SR) 78 (approximately 4 miles upstream of I-15), with testing conducted in May 2001 (MEC 2005, 2004; RWQCB 2002, 2001). Bioassessment testing and analysis methods were similar to those described above for the Carlsbad HU, with data from the noted sampling efforts typically at or below the mean ranking for all sites. Because BMI communities are sensitive to water quality (including criteria such as dissolved oxygen, sedimentation, nutrients and chemical/organic pollutants), the generally low rankings for the described sites likely reflect (at least in part) poor local water quality conditions.

Ambient bay and lagoon monitoring samples from the San Dieguito Lagoon (as described above for the San Elijo Lagoon in the Carlsbad HU) exhibited generally moderate to high individual and overall quality rankings for sediment chemistry, and low rankings for toxicity and benthic community structure. The described rankings were qualified as previously described, based on different conditions at individual embayments and the fact that the only one year of data were available (MEC 2005).

The referenced 2002 Section 303(d) and TMDL assessment does not identify any impaired water bodies within or adjacent to the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection. The closest listed impaired water body is Lake Hodges, located approximately one mile to the south, with impaired waters located further downstream including the Pacific Ocean shoreline at the San Dieguito River mouth (i.e., the San Dieguito Lagoon). The impaired listing for Lake Hodges affects an estimated area of 1,104 acres and includes low TMDL priorities for color, nitrogen, phosphorus and TDS. The impaired listing for the Pacific Ocean at the San Dieguito River mouth affects approximately 0.86 mile of shoreline and includes a low TMDL priority related to bacterial indicators (SWRCB 2003).

Groundwater

As previously described, groundwater is present within the project site and vicinity and occurs in both alluvial deposits (primarily along drainages) and bedrock. Historical water quality data for the project site and vicinity include sampling programs conducted in alluvial and bedrock aquifers located in the Escondido HSA during 1963-1964 and 1987 (USGS 1989), as well as sampling conducted in the Hodges HA between 1953 and 1989, and in 1990/1991 (DWR 1993). Test sites (i.e., wells) used for the referenced studies in the Escondido HSA are located predominantly along Escondido and Reidy creeks in areas upstream of the project site, although the 1987 study included two wells located along Escondido Creek within the project site. Data from these investigations reflect generally moderate to poor water quality, with TDS levels ranging from 419 to 8,280 mg/l in 1963-1964 (with a median level of 972 mg/l), and from 720 to 4,500 in 1987 (with a median level of 1,050 mg/l, USGS 1989). Observed water quality in the on-site wells was generally poor, with one well tested in 1963-1964 and exhibiting a TDS level of 1,230 mg/l, and both wells tested in 1987 and exhibiting TDS levels of 1,100 mg/l (USGS 1989). Data from the Hodges HA between 1953 and 1989 encompass approximately 30 wells located up- and downstream of Lake Hodges, including one well site within approximately 0.5 mile of the proposed roadway improvements at the Del Dios Highway/Valley Parkway and Via Rancho Parkway intersection. Observed data from these sampling efforts indicate varying groundwater quality levels, with generally good to moderate water quality in the 1950s and early 1960s (TDS levels mostly between 500 and 1,000 mg/l), locally diminished water quality during the later 1960s (potentially related to leaching from rising groundwater levels), and fluctuating water quality during the 1970s and 1980s (TDS levels between approximately 600 and 1,700 mg/l). Data from the 1990/1991 DWR study generally conform to the noted observations from the 1970s and 1980s, with 18 samples from 15 wells exhibiting TDS levels ranging from 515 to 2,310 mg/l (DWR 1993).

Recent known groundwater data from the site and vicinity are limited to three samples collected from alluvial aquifers within the project site during the described Phase I/II investigations, as well as testing at one of the on-site dairies conducted pursuant to the noted RWQCB WDRs. The three samples collected during Phase I/II investigations were associated with the exploratory Phase I borings described above in this section, with test data documenting generally poor groundwater quality. Specifically, a number of observed constituents in all three samples exceed established Basin Plan groundwater quality objectives for the Escondido HSA, including TDS (1,700 to 4,800 mg/l), chloride (470 to 940 mg/l) and sulfate 440 to 2,100 mg/l, PETRA 2002). Groundwater sampling is also conducted regularly at the described French drain on the De Raadt Dairy, pursuant to WDR requirements (as outlined above). Available data are limited to one sample collected in September 2001, with this information also reflecting poor local groundwater quality. Specifically, Basin Plan groundwater quality objectives in this sample were exceeded for constituents including TDS (1,816 mg/l) and nitrate (35.2 mg/l, PETRA 2002). Based on the recent and historical sampling data described above, groundwater quality in the project site and vicinity is assumed to be generally poor.